

### Amendments to the Claims

Claims 1-2 (Canceled).

Claim 3 (Currently amended): A method for treating pain caused by activation conditions  
~~associated with the response~~ of acid-sensing ion channels of the DEG/ENaC channel family  
comprising:

identifying a composition for inactivating the current in acid-sensing ion channels of the

DEG/ENaC channel family, comprising:

administering said composition to a cell expressing acid-ion sensing channels of the

DEG/ENaC channel family in the presence of acid and in the presence or absence  
of FMRFamide or FMRFamide-related peptides;

measuring the current of the channels of said cell; and

comparing the current of said cell in the presence and absence of said composition,

wherein inactivation of the sustained current of said cell in the presence of said  
composition indicates that the composition is suitable for treating conditions  
associated with the response of acid-sensing ion channels of the DEG/ENaC  
channel family; and

administering said composition to a subject in need thereof.

Claim 4 (Currently amended): A method for treating pain caused by activation conditions  
~~associated with the response~~ of acid-sensing ion channels of the DEG/ENaC channel family ~~to~~  
~~acidosis such as nociception~~ comprising:

identifying a composition that alters the activity of acid-sensing ion channels of the DEG/ENaC

channel family, comprising:

providing a cell expressing acid-ion sensing channels of the DEG/ENaC channel family;

treating said cell with a composition in the presence of acid and in the presence or

absence of FMRFamide or FMRFamide-related peptides;

detecting a change in activity of said an acid-ion sensing channels of the DEG/ENaC

channel family, thereby identifying a ~~compound~~ composition that modifies activity

of acid-ion sensing channels of the DEG/ENaC channel family; and

administering said composition to a subject in need thereof.

Claim 5 (Previously presented): The method of claim 4 wherein said change in activity is determined by measuring electrophysical analysis.

Claim 6 (Previously presented): The method of claim 5 wherein electrophysical analysis comprises measuring cell current.

Claim 7 (Previously presented): The method of claim 4 wherein said change in activity is determined using an assay that measures the opening and closing of said channels.

Claim 8 (Previously presented): The method of claim 5 wherein said assay comprises a voltage sensitive dye.

Claim 9 (Previously presented): The method of claim 5 wherein said assay comprises an ion-sensitive dye.

Claim 10 (Previously presented): The method of claim 4 wherein said assay measures cell death.

Claim 11 (Currently amended): A method for treating pain caused by activation~~conditions associated with the response~~ of acid-sensing ion channel alpha (ASIC $\alpha$ ) comprising:  
screening for a composition capable of inhibiting, ~~activating~~ or modulating channel activity of ASIC $\alpha$  comprising:  
contacting an FMRFamide or FMRFamide-related peptides with an ASIC $\alpha$  protein in the presence of acid and a test composition;  
analyzing the binding of the FMRFamide or FMRFamide-related peptides and the ASIC $\alpha$  protein, wherein a perturbation of binding indicates that the test composition inhibits or activates FMRFamide or FMRFamide-related peptides-ASIC $\alpha$  protein interaction; and  
providing a cell expressing ASIC $\alpha$  channels;  
treating said cell with a composition in the presence of acid and in the presence FMRFamide or FMRFamide-related peptides;  
detecting a change in activity of said ASIC $\alpha$  channels, thereby identifying a composition that modifies, activates, or inhibits activity of an ASIC $\alpha$  channel; and  
administering said composition to a subject in need thereof.